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Stated Meeting, January 21.

Present, thirty-nine members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the National Institution of Washington, dated 15th Jan. 1842,—from the Albany Institute,—and from Mr. Rebello, dated Rio Janeiro, 25th Nov. 1841, acknowledging the receipt of the Society's Proceedings.

From Mr. E. C. Bridgman, dated Macao, 2d July, 1841, transmitting a copy of the second part of a Chinese Chrestomathy, of which he is the author:—and

From Mr. Jacob Snider, Jun., dated 21st Jan. 1842, presenting the cast from Chantrey's bust of William Vaughan, of London, owned by the late librarian of the Society.

The Society passed a vote of thanks to Mr. Snider for this donation.

The following donations were announced:—

FOR THE LIBRARY.

American Archives: Consisting of a Collection of Authentick Records, State Papers, Debates and Letters and other Notices of Publick Affairs, &c. Prepared and published under Authority of an Act of Congress. 3 Vols. Folio. Washington, 1837, 39–40. *From Mr. Peter Force.*

A Digest of the Ordinances of the Corporation of the City of Philadelphia, and of the Acts of Assembly relating thereto. 8vo. Philadelphia, 1841.—*From the City Councils.*

Journal of the Asiatic Society of Bengal: edited by the Secretary. Nos. 22 to 29, inclusive. 8vo. Calcutta, 1841.—*From the Society.*

O Auxiliador da Industria Nacional, &c. Vol. IX. Nos. 1 to 6, inclusive. 8vo. Rio de Janeiro, 1841.—*From Mr. J. S. Rebello.*

Objections to Mr. Redfield's Theory of Storms, with some Strictures upon his Reasoning. By Robert Hare, M.D. 8vo.—*From the Author.*

FOR THE CABINET.

Two specimens of preserved butterflies, from Malta. Accompanied by explanatory letters from the donor, and the Rev. Dr. Bethune.—***From Mr. William Winthrop Andrews, U. S. Consul, Malta.***

Dr. Hare made an oral communication, in which he pointed out what he conceived to be very glaring errors in Mr. Redfield's opinions, which may be briefly stated as follows:—

1st. That all atmospheric currents, whether designated as trade winds, gales, storms, tempests, tornadoes, thunder gusts or hurricanes, are to be explained by a reference to the "simple conditions of the great laws of gravitation;" the agency of electricity being neglected, and "the theory of *calorific rarefaction*" renounced.

2d. In alleging the existence of "*opposing and unequal forces*," without specifying their nature, or accounting for their existence; although implying that they are the effects of "*the simple conditions of the great laws of gravitation.*"

3d. In assigning to "*all fluid matter a tendency to run into whirls or circuits, when subjected to opposing and unequal forces;*" which can be true only in some peculiar cases of the influence of such forces.

4th. In treating of *all* storms as whirlwinds; or in other words in making the words storm and whirlwind synonymous, and yet representing a rotative movement in the air, or in other words a whirlwind, "*as the only known cause of violent and destructive winds or tempests;*" so that a whirlwind is the only cause of its own force!

5th. In averring that "*all narrow and violent vortices have a spiral involute motion, quickening in its gyrations as it approaches the centre or the axis of the whirl;*" whereas, it must be evident that, when a whirl is the consequence of forces applied at the periphery of any mass, the consequent velocity in any part of the mass will be less in proportion to its proximity to the axis; and that the only case in which it will be greater in proportion to the nearness of the axis, is where the motion proceeds from some competent cause acting at the centre.

6th. In admitting the gyration which he considers as the cause of storms, to quicken as it approaches the axis of motion, without perceiving that this characteristic is, as above stated, irreconcilable with his fundamental doctrine that "*gyration, caused by opposing and unequal forces*," acting necessarily at points remote from the axis, is productive of all the phenomena in question.

7th. In representing a "*vortical*, or gyratory, *action*,"* for which no source is assigned, *unless* "*unequal and opposing forces*" resulting from "*the simple conditions of the great laws of gravitation*," as the proximate cause of the upward force of tornadoes; whereas, if such action be not the effect of an upward force, but is on the contrary a proximate cause of the phenomena, it could only have an influence the opposite of that suggested by Mr. Redfield, and which the facts require. Necessarily producing a centrifugal movement in the lower stratum of air, it would, by diminishing the pressure about the axis of the whirl, cause the upper air, beyond the theatre of the gyration, to descend in order to restore the equilibrium.

Dr. Hare made another oral communication respecting a new ethereal liquid which he had succeeded in obtaining.

He mentioned that he had procured by means of hyponitrite of soda, diluted sulphuric acid, and pyroxylic spirit, an ethereal liquid in which methyl (C_2 H_3) might be inferred to perform the same part as ethyl (C_4 H_5) in hyponitrous ether. In fact, by substituting pyroxylic spirit for alcohol, this new ether was elaborated by the process for hyponitrous ether, of which he had published an account in the Society's Transactions, Vol. VII., Part 2.

The compound which was the subject of his communication, had a great resemblance to alcoholic hyponitrous ether, similarly evolved, in colour, smell and taste; although there was still a difference sufficient to prevent the one from being mistaken for the other.

Pyroxylic spirit appeared to have a greater disposition than alcohol to combine with the ether generated from it, probably in consequence of its having less affinity for water. The boiling point appeared to be nearly the same in both of the ethers; and in both, in consequence of the escape of an ethereal gas, an effervescence, resembling that of ebullition, was observed to take place at a lower temperature than that at which the boiling point became stationary. The ethereal gas, of which Dr. Hare had given an account in his communication respecting hyponitrous ether, seemed to have escaped the attention of European chemists; and, even after it had been noticed by him, seemed to be overlooked by Liebig, Kane, and others in their subsequent publications.

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* See American Journal of Science, Vol. XXXVI. No. 1.

Dr. Hare attached the more importance to his success in producing the ether which was the subject of his communication; since, agreeably to Liebig, no such compound exists, and it is to be inferred that efforts to produce it had heretofore failed. It was presumed that this would excite no surprise, when the difference was considered between the consequences of the reaction of nitric acid with pyroxylic spirit, and with alcohol.

The liquid last mentioned is now viewed as a hydrated oxide of ethyl, while pyroxylic spirit is viewed as a hydrated oxide of methyl. When alcohol is presented to nitric acid, a reciprocal decomposition ensues. The acid loses two atoms of oxygen, which by taking two atoms of hydrogen from a portion of the alcohol, transforms it into aldehyd; while the hyponitrous acid, resulting inevitably from the partial deoxydizement of the nitric acid, unites with the base of the remaining part of the alcohol. But when pyroxylic spirit is presented to nitric acid, this acid, without decomposition, combines with methyl, the base of this hydrate; so that, as no hyponitrous acid can be evolved, no hyponitrite can be produced. Thus in the case of the one there can be no ethereal hyponitrite, in that of the other, no ethereal nitrate.

Dr. Hare regretted that Liebig should not have been informed of the improved process for hyponitrous ether, to which he had referred in commencing his communication. Instead of recommending a resort to that process, it was advised that the fumes, resulting from the reaction of nitric acid with fecula, should be passed into alcohol, and the resulting vapour condensed by means of a tube surrounded by a freezing mixture.

This process Dr. Hare had repeated, and found the product very inferior in quantity and purity to that resulting from the employment of a hyponitrite. In this process, nascent hyponitrous acid, as liberated from a base, is brought into contact with the hydrated oxide. In the process recommended by Liebig, evidently this contact could not take place; since it was well known that hyponitrous acid could not be obtained by subjecting fecula and nitric acid to distillation, and condensing the aëriform products.*

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* The process alluded to is as follows:—Seven parts of acid, eight parts of alcohol, fourteen parts of water, and fourteen of hyponitrite being prepared, add seven parts of water to the salt and seven to the acid, and allow the mixture to cool. The saline solution and alcohol are introduced into a tubulated

Professor A. D. Bache communicated, on behalf of Mr. Nicollet, of Washington, an abstract of observations on the magnetic dip, made at Baltimore, Washington, Philadelphia, Albany, Oswego, Niagara Falls, Detroit, Mackinaw Island, Chicago, Joliet, Ottawa, Peru, Illinoistown and St. Louis. He also read a letter from Major Sabine, communicating the progress of the general series of magnetic observations; and one from Prof. Loomis, of Western Reserve College, stating that, last autumn, he had made observations of the magnetic dip at nearly forty different stations, in the north-west part of the United States, the results of which he intended hereafter to communicate to the Society.

Dr. Goddard showed specimens of photographic portraits made by the diffused light of a room, and by a peculiar process in which bibromide of iodine is used. This process he described, and stated that he had ascertained only to-day, that a similar method had been presented to the French Academy, which, however, in some particulars, was inferior to his own.

Mr. George Ord was elected Librarian, in the place of John Vaughan, deceased.

The following standing Committees were appointed for the present year.

Of Finance.—Mr. C. C. Biddle, Dr. Patterson, and Mr. Nicklin.

Of Publication.—Mr. Lea, Dr. Hays, and Mr. Fisher.

On the Hall.—Mr. Campbell, Mr. Richards, and Mr. G. W. Smith.

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retort, of which the recurved and tapering beak enters a tube, which occupies the axis and descends through the neck of an inverted bell-glass, so as to terminate within a tall phial. Both the tube and phial must be surrounded by ice and water. The diluted acid is then added gradually. A water-bath, blood-warm, is sufficient to cause all the ether to come over.

Agreeably to another plan, the materials, previously refrigerated by ice, are introduced into a bottle, also similarly refrigerated. Under these circumstances the ether soon forms a superstratum which may be separated by decantation.

This last mentioned process does not answer so well for the hyponitrite of methyl, on account of the pyroxylic spirit being prone to rise with the ether. Yet, the spirit may be separated from the ether by anhydrous chloride of calcium.

On the Library.—Dr. Hays, Mr. Campbell, and Mr. Penington.

Agreeably to the laws, the list of surviving members was read; by which it appeared that the number of members, at the beginning of the year was 329; namely, 228 resident in the United States, and 101 in foreign countries.

The following gentlemen were elected members of the Society:—

Alexis de Tocqueville, of Paris.
Baron de Roenne, of Prussia.
John F. Frazer, of Philadelphia.
E. Otis Kendall, of Philadelphia.
Charles Lyell, of London.
J. N. Nicollet, of Washington.
Baron de la Doucette, of Paris.
E. W. Brayley, of London.

Stated Meeting, February 4.

Present, thirty-one members.

Mr. Du Ponceau, President, in the Chair.

Professors Frazer and Kendall, members elect, were presented to the President and signed the Laws.

Letters were read,—

From Baron Roenne, dated 29th January, 1842,—from Mr. Charles Lyell, dated 5th Feb. 1842,—and from Mr. J. N. Nicollet, dated 1st Feb. 1842, severally acknowledging the honour of their election as members of the Society:—

From the Geological Society of London, dated 21st Oct. 1841,—the Society of Arts of London, dated 27th Nov. 1841, and from the Royal Asiatic Society of London, dated 6th Nov. 1841, severally acknowledging the receipt of copies of the Society's Transactions:—

From Dr. Tidyman, of Charleston, dated 10th Jan. 1842, transmitting four volumes of the Statutes of South Carolina, as a donation:—and